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Case study of Alachua County Detention Facility renovation.

Moran, Peter F.

Monterey, California. Naval Postgraduate School

CASE STUDY OF ALACHUA COUNTY DETENTION FACILITY RENOVATION

BY

PETER F. MORAN

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CHAPTER 1

INTRODUCTION

Purpose of This Report

I chose to study the renovation of the Alachua County Detention Facility for several reasons. All of my experience is an owner's representative. I am a Lieutenant in the US. Navy in the Civil Engineer Corps and I worked in a construction contracts office representing the Navy. I have no experience as a contractor and I wanted to see how a contractor schedules work, handles change orders and manages the project. As an owner representative I am responsible for issues or events that change the schedule of work. If I have some appreciation for the way these changes impact the contractor it will make me more effective in discharging my duties. I needed to find a project that was similar in size and complexity to a typical Navy military construction project. I chose not to pursue residential construction because it does not have similar types of work or problems that large commercial projects encounter. The renovation of the Alachua County Detention Facility presented many different complex and unique problems that made it an ideal project to study. There were two similarities to a typical

Navy project. The owner of the facility is a government agency, Alachua County, and this creates interesting challenges because the contractor must deal with the realities of government bureaucracy. Second, renovation is not as straight forward as new construction. I found that renovation work is difficult to schedule because there are many ways to approach a project and many things remain hidden above ceilings and behind walls that could complicate work. I was also interested in becoming familiar with the Prima Vera scheduling program. I had used the program for a class project but I was interested in seeing how well the program performed in the real world. And finally I chose this particular project is that I wanted to see how prisons are designed. With so much attention paid to the criminal justice system I was curious to see what the inside of a detention facility looks like.

The original detention facility was built in 1970. The detention facility is only twenty years old but was in dire need of expansion and renovation. My first tour of the facility gave me a first hand view of the poor condition of the facility. Spaces for detention facility employees were overcrowded and poorly lighted and ventilated. Inmate cell pods were also had poor lighting, were overcrowded and generally in a poor state of repair. The renovation would bring the detention facility with current standards and provide a

cleaner and better organized facility. The new detention facility was constructed adjacent to the existing Alachua County Detention Facility and was designed to be connected to the existing facility. Construction on the new facility began in July 1992 and was completed in December 1993. With the new facility completed most inmates from the old facility were transferred to the new facility while renovation work was ongoing. The renovation work included new electrical, mechanical, fire and smoke detection and suppression and security systems, new recreation facilities for inmates and modernization of the detention facility personnel administrative spaces. In the renovation design certain areas were changed functionally but most areas retained their original function. The exterior of the facility was also extensively renovated. An access road, storm water collection system and exterior lighting was to be constructed along with a wet retention pond and other landscaping details.

The company responsible for the construction of the new detention facility and renovation of the old facility is Perry - Parrish. This is a joint venture between two Gainesville based construction companies, Charles R. Perry Construction, Inc. and M. M. Parish Construction Co. This joint venture is providing construction management services and all work is

subcontracted to various local specialty contractors. Mr. Lloyd Kelly is the project manager for Perry - Parish Inc. The owner's representative is Mr. Paul Houston, Facilities Manager for Alachua County Department of Administrative Services.

The agreement between Mr. Kelly and I was that I would complete the initial scheduling of the renovation project. Scheduling of the project allowed me to become familiar with the scope of work, the subcontractors that performed the work and look for any potential problems that may occur. I would also update the schedule one time to show how the work progressed. By updating the schedule I could judge my skills as a planner and scheduler. I would also be able to see where the schedule failed to show work items or dependencies and where work was not completed on time. As a Navy representative I pay a considerable amount of attention to the schedule provided by the contractor. So a schedule has always been an important piece of paper that I have used as a guide and measuring device for payment to the contractor.

CHAPTER 2

SCOPE OF WORK

The old detention facility is divided into three separate areas, quads H, J and K (See figures 1, 2 and 3). Two of these quads, H and K, house

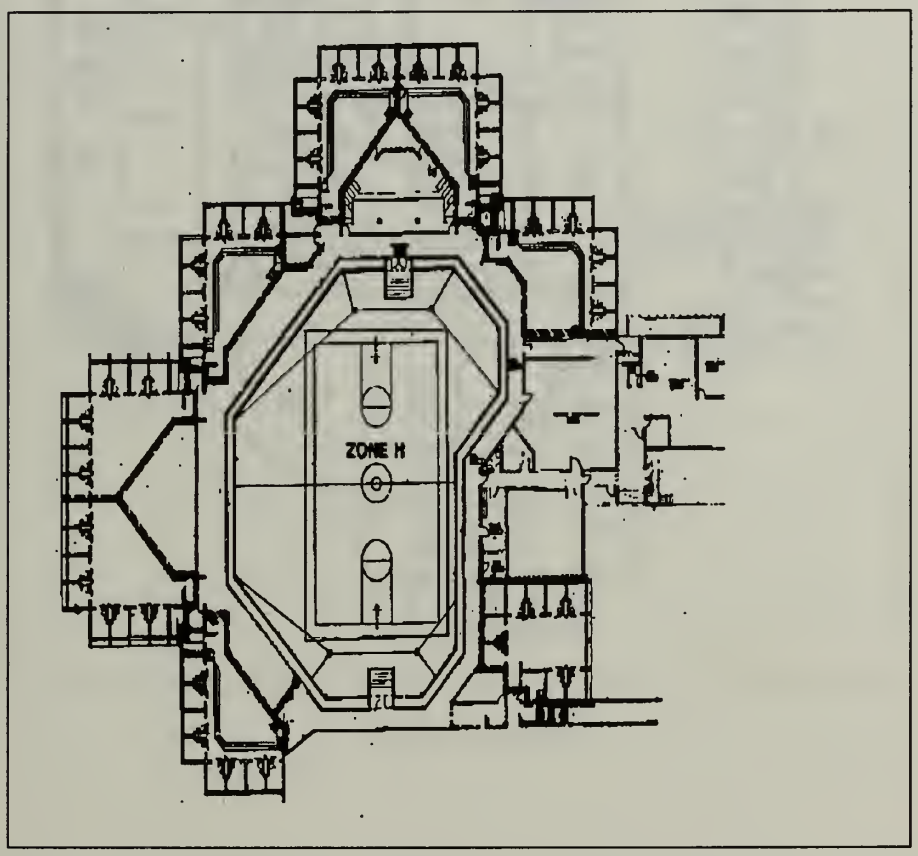

Figure 1 Quad H

inmates the third quad, J, serves as the detention facility administrative area. Quad K, was partially renovated subsequent to starting work on the new detention facility. This was done so that Perry - Parish get a feel for the work

and determine what problems might be incurred during renovation of the rest of the detention facility.

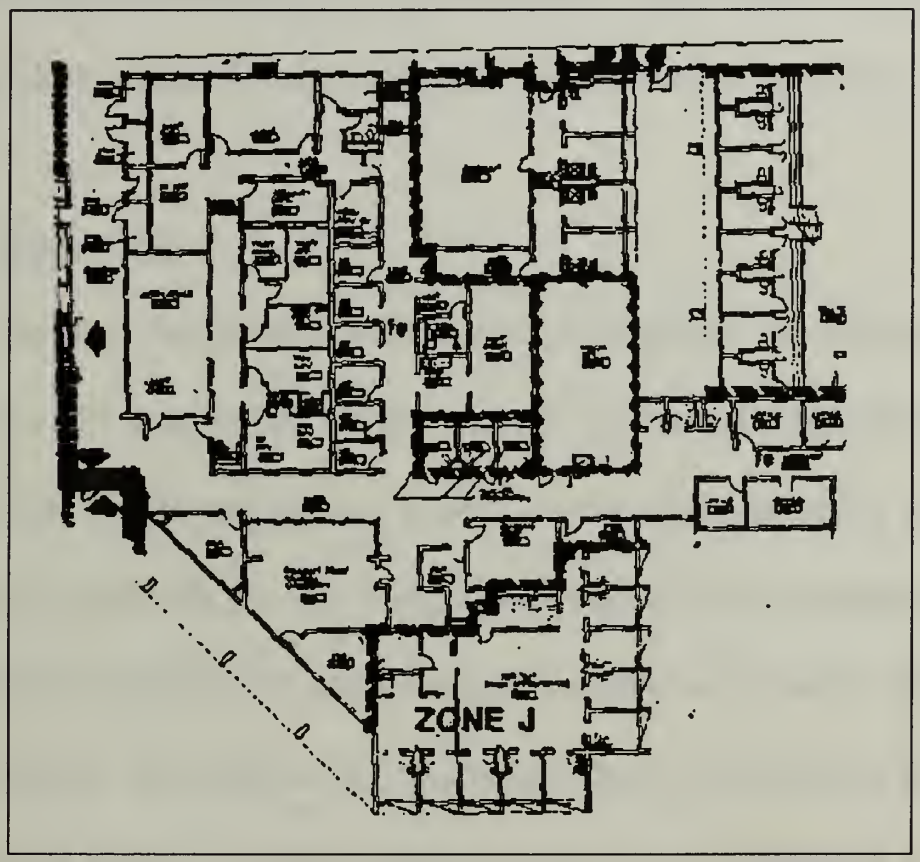

Figure 2 Quad J

The project required a considerable amount of demolition throughout the old facility. The construction of a new detention facility along side the old detention facility left much of the old facility space, with the exception of inmate cells, no longer functional. The new detention facility had a cafeteria, inmate recreation facilities, administrative spaces for detention facility

employees and a new security system for all doors, locks and monitoring devices. This left the kitchen, old administrative spaces and security system in the old detention facility no longer functional. Only inmate cell pods retained their original function and were spared extensive demolition.

Inmate Cells

The work inside inmate cells was mainly cosmetic. New lighting fixtures, a new coat of paint and new cell door controls made up the work. Inmate cells are grouped together in pods. In the existing detention facility there are 13 cell pods and each pod contains eight to twelve individual cells for a total of 114 individual cells. Each pod of cells was to have a shower shall installed. This required that mechanical rooms be demolished to provide the required space. The doors to individual cells were straightened but otherwise left intact and new a door control system was installed on all cell doors. Doors that separated pods of cells from the corridors were removed and replaced with reinforced sally port doors. The old detention facility needed to be brought into compliance with the current fire protection code and this included several improvements. New fire suppression and smoke detection systems were installed in each of the pods. Partitions that surround

the cell pods were upgraded to smoke tight construction and two hour fire walls. All doors were upgraded to one and one half hour fire rated doors.

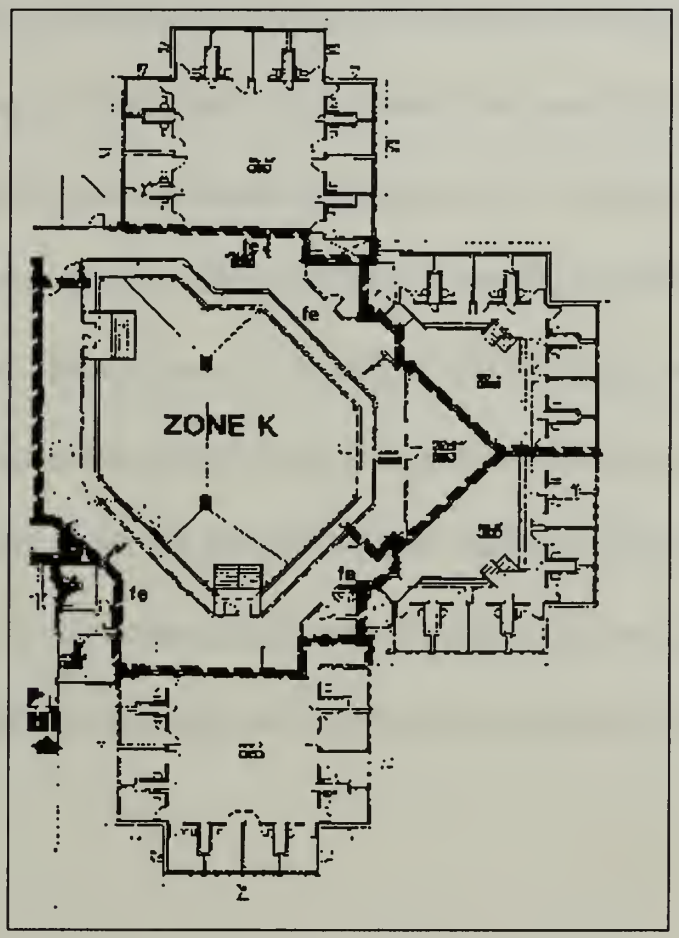

Figure 3. Quad K

HVAC System

New roof top HVAC units were installed throughout the old detention facility. The existing central HVAC system was disassembled. A new dust work system replaced the existing duct work that configured with the new floor plan.

Administrative Area

This area was originally designed for inmate receiving, temporary holding, visiting area and administrative area. The area retained its administrative function but inmate receiving and the visiting areas are now located in the new facility. This provided for expansion of the administrative offices and guard lounge areas. All ceilings, electrical and mechanical work were demolished and numerous walls were removed to accommodate the new design. This area presented special problems during the renovation. This area was to serve as command and control center of the two inmate quads. Therefore all security systems and door control operations terminated in this area.

Roof

The existing built up roof was removed and replaced with a five ply built up roof. New roof top air conditioning units were installed as was a new lighting protection system.

Exterior Grounds

The surrounding area outside the detention facility was extensively remodeled. All chain link fence was removed. A cluster of four portable trailers was leveled and the entire area was graded for drainage. There was extensive landscaping work that was completed and new security lighting was added to the area. A wet retention pond was constructed, an access road on the east side of the detention facility numerous trees were planted and all disturbed areas were sodded. See Figure 4 for details.

Interior Areas

There were two primary common areas prior to renovation. The common areas consisted of two TV rooms between cell pods. These areas were cleaned up, provided additional lighting and new flooring. The entire kitchen was demolished. All appliances and the ventilation system were removed along with several partition walls. This area was became the new inmate multipurpose room with educational equipment and storage area.

Corridors

The corridors connected all the quads and circled the courtyards.

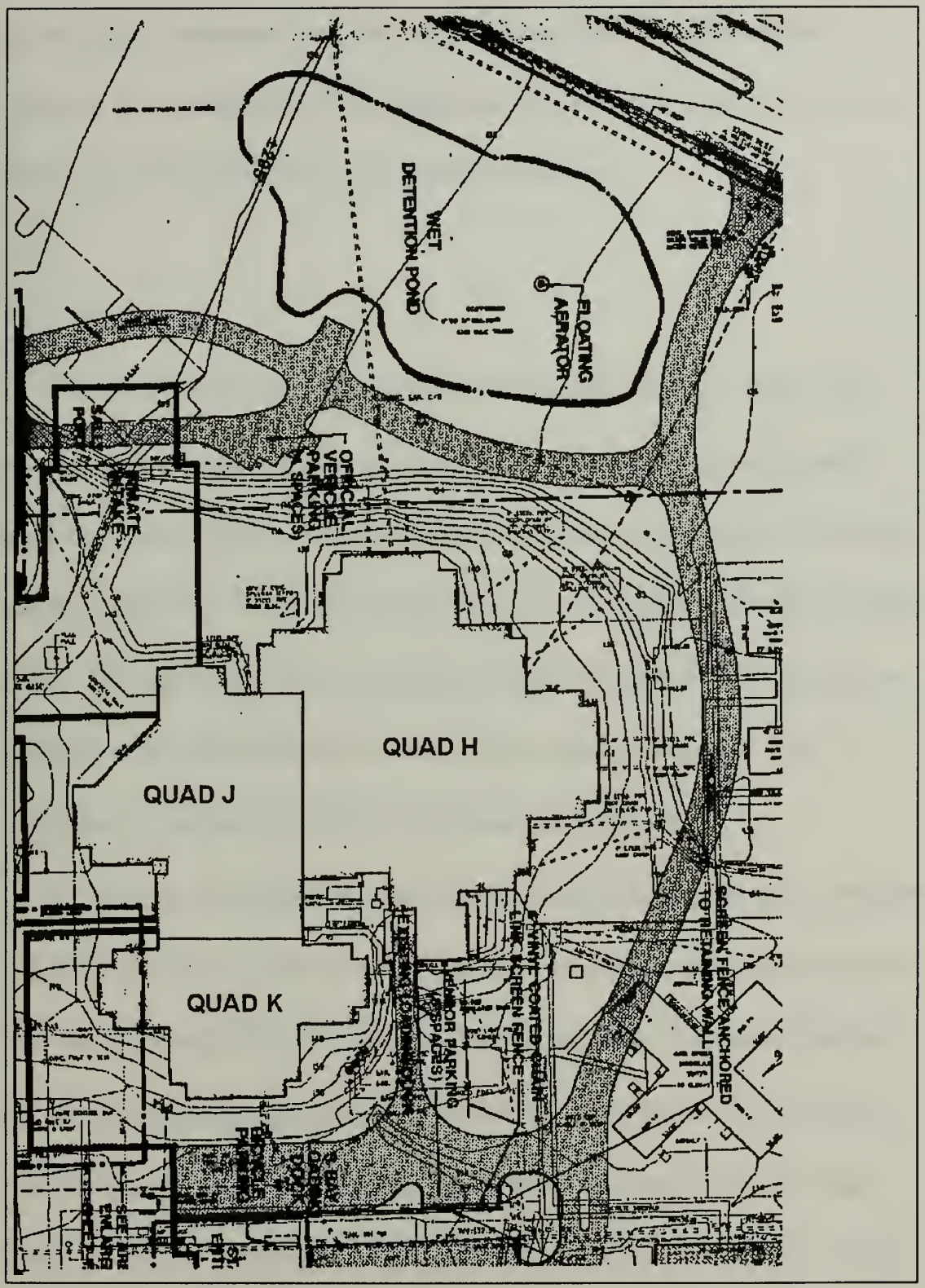

Figure 4. Exterior Grounds

All ceilings, mechanical and electrical systems were demolished and replaced. The existing carpet flooring was replaced with vinyl tile and new security monitoring devices were installed overhead.

Courtyards

Quad H and K have courtyards in the middle of these quads. These courtyards consisted a grassy or dirt area with a few trees growing in the middle to provide shade. Inmates had access to these courtyards so that they could get fresh air. These dirt courtyards were converted to inmate recreation areas. The recreation yards consisted of a slab on grade with a steel frame and cage enclosed a basketball court. The courtyard in quad K was completed in conjunction with interior renovation in 1992.

The way the courtyards were situated made work in the area very slow and labor intensive. Several feet of soil was excavated out of the courtyard. This was accomplished with a Bobcat loader and wheel barrels to haul the soil through the detention facility to the outside were it was hauled off site. Fill was brought into the courtyard via wheelbarrows and leveled by hand. The location also dictated that the concrete be pumped over the roof for the slab and retaining wall.

CHAPTER 3

SCHEDULE DEVELOPMENT

Mr. Kelly allowed me develop the schedule as I saw fit. The only guidance he provided was that the project must be completed by 01 September 1994 as called for in the project's contract. After I had finished the schedule Mr. Kelly and his project superintendent would review the schedule and advise me of any changes that they deemed necessary. I did not ask any of the subcontractors for any input. I felt that they would not provide me timely information and that they would not give enough attention to the work for accurate estimates. Instead I used the project superintendent's experience and guidance for any questions on work item duration, sequence of work or if I did not understand the project plans.

Move In

The start of the renovation of the old detention facility was dependent on two items: 1) The completion of the new detention facility, 2) Transfer of the prisoners from the old facility to the new facility. The original schedule indicated that the inmates would be transferred 21 December 1993 and work would begin in the old detention facility on 3 January 1994. Inmates would

continue to be housed in quad K until the completion of work in quad H. Once work was completed in quad H prisoners would be transferred from quad K to H. Then the remaining work in quad K could be completed (Some work was completed in 1992). This was necessary because the new detention facility was not designed to house all inmates from the old detention facility. The requirement that inmates would be living in quad K presented a small problem with isolating the electrical and mechanical systems. Inmates in quad K required water, power and air conditioning. In addition to isolating the utility systems several temporary walls were constructed to isolate workers from the inmates.

Demolition

Demolition of interior spaces would begin immediately upon move in. The majority of the material to be removed was overhead plaster ceilings, duct work, water pipes and electrical conduit. The removal of demolition debris was a problem. The first important item I learned about detention facility design and was that there are a minimal number of openings to the outside of the building. All the debris generated left the interior of the detention facility through one doorway in quad H. The combined area of

quads H and J is approximately 44,000 square feet. In addition to the single doorway the detention facility is very compartmentalized with many corridors and small rooms especially in quad J. Work crews would be demolishing and removing the debris while other crews are bringing material in to begin renovation work. There is very little open space to use for storage of material or debris. These problems complicated a simple demolition phase and added several days on to the schedule. In addition these special problems required that subcontractors communicate among themselves so that a safe working environment could be maintained.

Inmate Cell Pods

Inside the inmate cell pods very little demolition was necessary, instead there was a need for cleaning of the cells. The cells were to be steam cleaned. This method of cleaning was found to be the most efficient at removing the dirt and grime that built up on the cell walls. This is one of the lessons that subcontractor learned while working in quad K two years ago. Once the cells were cleaned and the pod doors removed, the cell doors could be straightened and aligned, shower shall construction begun, the new

lighting, fire protection and the new sally port and door control systems installed.

Roofing, Lightning Protection & Exterior Painting

While the interior demolition and cleaning work was on going the built up roof was scheduled for replacement. In conjunction with the roof replacement was the installation of a lightning protection system. Work on the lightning protection system was to be accomplished over several phases. The first phase was to install conduits through the roof. Once the roof was replaced the lightning rods would be attached to the roof and the cable connected and the whole system would be tested and certified. Another work item that was to be worked concurrently with the roof replacement was the installation of the rooftop air conditioning units. Openings would be cut in the roof and the units set in place prior to the installation of the new roof.

Interior

Once the quads H and J were protected from the weather work could begin on the interior finish. Installation of the HVAC ducting and electrical conduit in quad J and the corridor of quad H had to be completed prior to

work beginning on the plaster ceiling. The plaster ceiling consisted of a wire mesh grate with a light weight mortar covering. This security ceiling was used in most office spaces and in corridors and required a special subcontractor to construct the ceiling. Once the ceiling was in place the new lighting could be installed. The walls of the detention facility are predominately made of concrete block and did not provide adequate smoke protection for the inmates. To solve this problem the design called for sheet rock to be laminated over the walls using adhesive sealant. Finally the interior surfaces could be painted and the new tile flooring installed.

Courtyard

The construction of the recreation courtyard was also to begin immediately upon move in. Soil was to be removed from the yard through the detention facility corridors to the outside via wheel barrels. This process was slow and labor intensive but according to the contractor the least costly. Once the soil was removed the retaining wall could be constructed and backfilled. When the under slab drain work was completed the slab would be placed and construction of the steel frame could begin. The steel frame was enclosed with wire mesh on the sides and top. The courtyard when

completed contained a regulation size basketball court. The yard was not protected from the weather but it did provide inmates a source of recreation.

With the roof work mostly complete exterior painting could begin. The old facility exterior would be patched and painted to match the color of the new facility.

Connecting Corridor

During the renovation of the old detention facility a new corridor was constructed between quad J and quad C of the new facility. This corridor would allow inmates to transfer between facilities. This corridor was the single link between the two buildings. The corridor was approximately 150 feet long and was constructed of concrete block units and a concrete deck roof. The corridor was started after move in and it was required to be completed at the same time as quad J.

Quad K

Once all work was completed in quads H and J prisoners will be transferred from quad K to quad H. The reaming work in quad K is not nearly as extensive as in quads H and J. All work had been completed in the

cell pods and courtyard. The remaining interior work was demolition and replacement of the quad corridors. The remaining exterior work included replacement of the built up roof, installation of the lighting protection system and exterior painting.

Landscaping & Other Grounds Renovation

The work on the exterior of the detention facility could be completed at the discretion of the contractor since it had no impact on the schedule and most of the work was not interdependent. All work must be complete by 30 September in order to meet contractual commitments. All demolition work had to be complete before work could begin on the access roadway. The wet retention pond and the landscaping around the pond was completed first followed by the storm sewer pipe and roadway.

Subcontract Work

Since Perry - Parish provided only project management supervision all work was subcontracted to local contractors. Below is listing of contractors and the work that they were responsible for:

Subcontractor	Responsibility
Aztec Waterproofing & Coatings	Interior & Exterior Painting
All Florida Electric	Lightning Protection System
Climate Control Mechanical	HVAC System
ESI Industries	Electronic Security Systems
Foote Steel Corporation	Courtyard Steel Frame / Screen
Gainesville Landscape Contractors	Landscaping
Joyner Construction Company	Concrete Work
Kobal Construction & Engineers	Civil Work
Lake Plumbing	Plumbing Work
Liddel	Windows
Painter Masonry	Masonry Work
Poole Roofing & Sheetmetal	Roofing
Southeast	Fire Protection Systems
Sun Coast Acoustics	Suspended Tile Ceilings
Taylor, Cotton & Ridley	Doors and Door Controls
Teal Tile	Carpeting & Tile

Subcontractors were provided schedules for review and comments prior to work beginning. There were no comments so the first schedule was sent to all contractors in December 1993. Revisions to the schedule were sent out as required. The last update was done on 19 May 1994. Subcontractors were expected to meet schedule completion dates in order to meet contract completion dates.

The original schedule is in Appendix A.

CHAPTER 4

AS - BUILT SCHEDULE

" A schedule is a time-phased plan for accomplishing tasks that make up a project. It is based on specific logical relationships between tasks and on estimated task durations. It is very unlikely that the actual task duration will be exactly as estimated. It is also unlikely that the actual construction sequence will be exactly as depicted in the logic diagram." [1] The original schedule that I completed differs significantly from the current as-built schedule. There are several reasons for the disparity including a late start of the project, difficulties in procurement of long lead items, my underestimation of task durations and changes to the scope of work. The latest update to the schedule is in Appendix B.

Time Delays

The most noticeable differences in the two schedules are the project start dates. The original schedule called for work to begin on 03 January 1994. Actual work began inside the detention facility on 28 February 1994. The owner, Alachua County, was not ready to transfer prisoners from the old

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[1] Willis, Edward M., Scheduling Constrction Projects, John Wiley & Sons, Inc., 1986, p. 269.

facility to the new facility. Prisoners were scheduled to be transferred on 21 December 1993. The schedule was modified because prisoners would not be transferred until 25 January. The transfer of prisoners was pushed even further back until they were actually transferred on 28 February 1994. With the transfer complete work could begin. This schedule set back caused a two month delay in the project. Then as if that delay was not significant enough on 7 March 1994 a prisoner escaped from the new detention facility. This directly affected work on the detention facility renovation. All work was halted until an initial investigation was completed. This investigation into the escape of the prisoner took one week. Even after the investigation was completed work progressed at a much slower rate as additional security measures were implemented. A review of the contractor's monthly manpower report and the work in place (WIP) report (See Appendix C) provides graphical representation of the delay and the affects on scheduled manpower and WIP. Both graphs show a scheduled dip in manpower and WIP in month 18, December 1993. The actual dip in manpower and WIP comes in month 20, February 1994. This dip reflects the slow down as the new facility is completed and the start up of work on the renovation of the old facility.

Scope Changes

There were several modifications to the original design. Some of these changes were initiated by the owner and some by the contractor. The owner wanted walls and doorways located in areas different that as shown on the plans. A larger change was the result of a design failure. The walls of the detention facility were made of masonry block units and the design called for 1/2 inch sheetrock to cover the walls. An adhesive was to be used to attach the sheets to the wall. However, the walls were not tool finished and as a result of uneven surface the sheetrock would not adhere to the walls. The alternative design called for sheet metal hi caps to be attached to the wall and the sheetrock could be screwed into the hi caps. This changed added considerable work to the task of finishing the interior surfaces.

Material Procurement

Long lead procurement items are always a management problem and the detention facility was no exception. Two separate but related items were causing problems with the schedule. The door control system and sally port doors that replaced cell pod entry doors were delayed by several months.

The installation of these special doors were to follow the demolition of the old doors on the schedule. The delay caused some tasks to be rearranged in the schedule of work. By rearranging the schedule this delay did not affect the critical path of the project and cause further delay.

Critical Path

The critical path in the original schedule showed provided insight into the project. The critical work in quad H was all interior work such as demolition work, installation of duct work, plaster ceilings, painting and flooring. The outside work had some slack in the schedule which I felt was good because of the weather does not always cooperate in Florida. A week of wet weather could cause serious delays. In quad K much of the interior work had already been completed and all the exterior work was on the critical path and there was no where to make up for lost time. The work on quad K was scheduled to begin late June, the height of the rainy season. So there is real reason for concern of a delay due to weather conditions.

The critical path for the as-built schedule closely resembles the original schedule with the exception that it completes one and a half months later. The original schedule called for the project to complete on 8 July but that date

was quickly revised to 20 September because of the delay in transferring the prisoners. I also added some time into the schedule as a conservative measure. The latest as-built schedule has the project completing on 8 November 1994. Mr. Perry is confident that the project will be completed no later than 30 September. He choose not to have me fit the schedule to that date, he wanted to make sure he had plenty of slack in the schedule. So there is a four month time difference between my original schedule and the latest as-built schedule.

CHAPTER 5

SCHEDULING PROGRAM EVALUATION

The scheduling program that was used to generate the schedule was Prima Vera Version 5.0. Updates to the schedule were made using the Prima Vera for Windows. The contractor had the program installed on-site and had previously generated schedules for the new detention facility construction. I became familiar with the program while taking CCE 5035, Construction Planning and Scheduling. I found the program to be extremely powerful in manipulating the schedule for this project.

Schedule Setup

I found Prima Vera to be an extremely powerful scheduling tool and I was able to master the basics of the program relatively easily. Using the Penguin scheduling tool I was able to build the schedule and see a visual representation on the screen. There are two methods to input task data. The first is to use the form layout. On the form screen the program asks for all the pertinent data such as; task code number, task description, duration, dependencies, type of dependency (start - start, start - finish, finish - finish) and any lag time. Using the Penguin format the same information is required

to be inputted but on a more visually enhanced screen. CPM type boxes are generated with the task code, description and duration then using the mouse you are able to connect the boxes to show dependencies and time lags. The visual representation of the CPM makes it much easier to input data and arrive at an accurate logical schedule. Prima Vera calculates the schedule upon completing the input and if there are any logic errors in the schedule the program will notify you of a problem. It will not tell you where the problem is but is fairly simple to figure out.

Sorting Routines

One of the best attributes of the product is the ability to sort the schedule in various ways. It is possible to sort a schedule by 20 separate items. I did not find a need for such an aggressive sorting routine. The maximum number of times that I needed to sort by was three. For the project I sorted the project in several ways. I assigned work items to several categories; location, subcontractor, activity number and early start. Since the project involved several locations working at different times this sorting routine broke the project into three distinct areas. The locations I assigned were quad h, J, K and the corridor between the two facilities. The sort by

location and by early start provided the easiest output to follow the project flow. The sort by location showed where each work item was being completed. Sorting by subcontractor showed when contractors are scheduled for work but it did not provide much assistance in management of the project. The sort by early start did not provide useful output.

If you had an extremely complicated schedule with numerous parts and pieces it may very well be necessary to use all 20 items. The sorting routines provide the ability to generate numerous tabular or graphic reports that can provide necessary information to the user.

One draw back to the power of the sorting routines is that it takes several attempts before the user is able to generate the information he/she is looking to obtain. It is easy for the uninitiated to be intimidated by the sorting program.

Tabular and Graphical Reports

Prima Vera can provide the user both tabular and graphical reports in various formats and configurations. Included in the available reports are bar charts, logic diagrams, cost and resource use reports. The user can also generate a custom report if the provided formats do not meet the user's

requirements. It does take time to become familiar with the reports but it the program provides the opportunity to preview the output on the computer screen saving paper and time. Much of the information provided on the tabular reports can be shown visually using the graphical reports.

Changes to Schedule

Working with the contractor I made two major revisions to the original schedule. The original schedule took approximately 1 month to develop. I worked with the contractor starting in November 1993. It took me two weeks to become familiar with the plans and actual facility where the work was to be done. On work that I was not familiar with I received guidance from the project superintendent. He had the experience and knowledge I needed to finish the schedule. The original scheduled called for work to begin on 3 January 1994. The start date was moved back to 14 February 1994 and then to 27 February because the detention facility officials were not comfortable with transferring the inmates to the new facility until then. Actual work did not begin until the beginning of March. The contractor also added work to revised schedule that did not appear on the original schedule.

This work included the landscaping, access road and work near the women's holding facility.

With all the adjustments made to the schedule Prima Vera made it very easy to update the schedule. All adjustments could be made with in a few minutes and the graphics that P3 produces makes it very easy to track the history of the project.

Progress Updates

Progress updates are relatively simple using Prima Vera. The hardest part of updating the project is obtaining the information. This requires that some one familiar with the work provide an accurate estimate of how much work has been accomplished on a certain task. I did not go through the entire project and obtain these estimates. I relied upon the project superintendent's estimates which would be much more accurate than mine would be and the process would go quicker. The date of the update was completed was 25 May 1994. The input of the data into Prima Vera took only a couple of hours. The input data consisted of actual start date, actual finish date or percent complete. It was also possible to adjust the task duration period or the program would automatically calculate the remaining

duration based on the original task duration and percent complete. Once the input is completed the program can then reschedule the project based on the tasks completed, tasks partially completed and any additional tasks that may have been added or deleted. The program then provides an excellent graphical representation of the project. Tasks that are completed are shaded and a new critical path is calculated and highlighted. When the two plots of the schedules, original and updated, are compared side by side it readily apparent where the project fell behind or jumped ahead of schedule.

Program Drawbacks

The DOS version of Prima Vera requires 13 megabytes of memory for installation. When compared to a spreadsheet application which uses approximately 6 megabytes and a Window's based word processor requires approximately 10 megabytes that is a lot of memory storage. The latest version of Prima Vera is a Windows application which requires even more memory than the DOS version. The size of the program is a good indicator of its potential.

The program requires time to learn. Because the program is large and complex the user has to refer to the user manuals and experiment with various

options in order to fully understand the power of the program. It is also necessary to use the correct application. This program is not for the user that is easily intimidated by numerous options and windows. It is very easy to get lost in the details of the program. The user should have a project that has an extensive number of tasks with various dependencies otherwise the user is better off using a less complicated program.

CHAPTER 6

CONCLUSIONS

As I stated at the beginning of this paper I had three main objectives. The first was to see how a typical contractor schedules a project. Second, how do change orders affect the schedule. Finally, observe the overall management of the project. The case study of the Alachua County Detention Facility Renovation provided me with valuable insight into how contractors strive to operate. In addition the experience was both professionally and personally rewarding. While it is a single case study I feel that I learned some valuable lessons.

The first lesson I learned is that all personnel involved with the project view the schedule in a different light. The project manager looks at the schedule from a distance. He knows when he wants to accomplish the work and this is mostly based on experience. He is not overly concerned with the interrelationships between tasks or duration of tasks. It is to used as a negotiating tool when asking for time extensions for change orders and unforeseen conditions.

The project superintendent on the other hand is more concerned with the details of the schedule than the project manager. The superintendent

relies on his expertise to provide a logical accurate schedule. The superintendent should be the one who develops the schedule since it his primary responsibility to ensure that it is on schedule. He is the one who pays close attention to duration and relationships. In the this case the superintendent did not have the proper computer training. He could not create the schedule using Prima Vera or any computer program. If there is one item I could pass along to the contractor it would be to have the project superintendent properly trained in the computer scheduling tools.

The second lesson I learned is that there are many ways to complete a schedule. I spent a considerable amount of time trying to get the sequencing of tasks established. In general I was fairly successful in establishing the sequence but not in all the cases. If certain items are not available like doors the contractor has to go head and paint the rooms and do touch up painting after the doors have been installed.. There is no way to predict all the subtle changes that may occur as the project progresses.

I also did not provide sufficient detail in the schedule. Some tasks I lumped together under a general heading like "interior finish" or "mechanical system". Some of these tasks involved more than one subcontractor and some tasks seemed to be duplicated. If I had it to do over again it is possible

that I could have doubled the number of tasks to be scheduled. There are 128 tasks in the schedule I designed. There is little doubt that I could have easily exceeded 200 tasks.

Overall the project will be a success. This can be attributed to two factors. The first and most important factor was open communication among the project management team, the subcontractors and the owner's representatives. From my observations of day to day activities on the project site there was a continuos flow of people through the trailer throughout the day with problems to resolve. Problems seemed to be resolved relatively quickly and with a minimum amount to delay.

The second factor that contributed to the success of the project was the personnel on the Perry - Parish project management team were fully capable of fulfilling their assigned duties. The team was professional and straight forward in their dealing with the customer and subcontractors and they expected to be treated similarly.

While I did manage to gain a considerable amount of knowledge on project scheduling there were other things going on with the project that I did not have time to pursue. How was the project doing financially for the contractor? How the financing of the project affect the two companies,

M. M. Parish and Perry Construction. How did the joint venture come about? These questions are not directly related to the work but are important issues in construction management.

APPENDIX A: ORIGINAL SCHEDULE

1000	3JAN94	7JAN94	5	0
2010	31JAN94	3FEB94	4	0
2030	31JAN94	11FEB94	10	0
3080	4FEB94	10FEB94	5	0
2040	14FEB94	25FEB94	10	0
2050	14FEB94	4MAR94	15	0
1010	21FEB94	22FEB94	2	0
1020	21FEB94	23FEB94	3	0
2020	21FEB94	4MAR94	10	0
3039	21FEB94	25FEB94	5	0
1011	23FEB94	15MAR94	15	0
1030	23FEB94	24FEB94	2	0
1021	24FEB94	2MAR94	5	0
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1051	1MAR94	21MAR94	15	0
1070	1MAR94	2MAR94	2	0
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1041	7MAR94	11MAR94	5	0
1091	7MAR94	25MAR94	15	0
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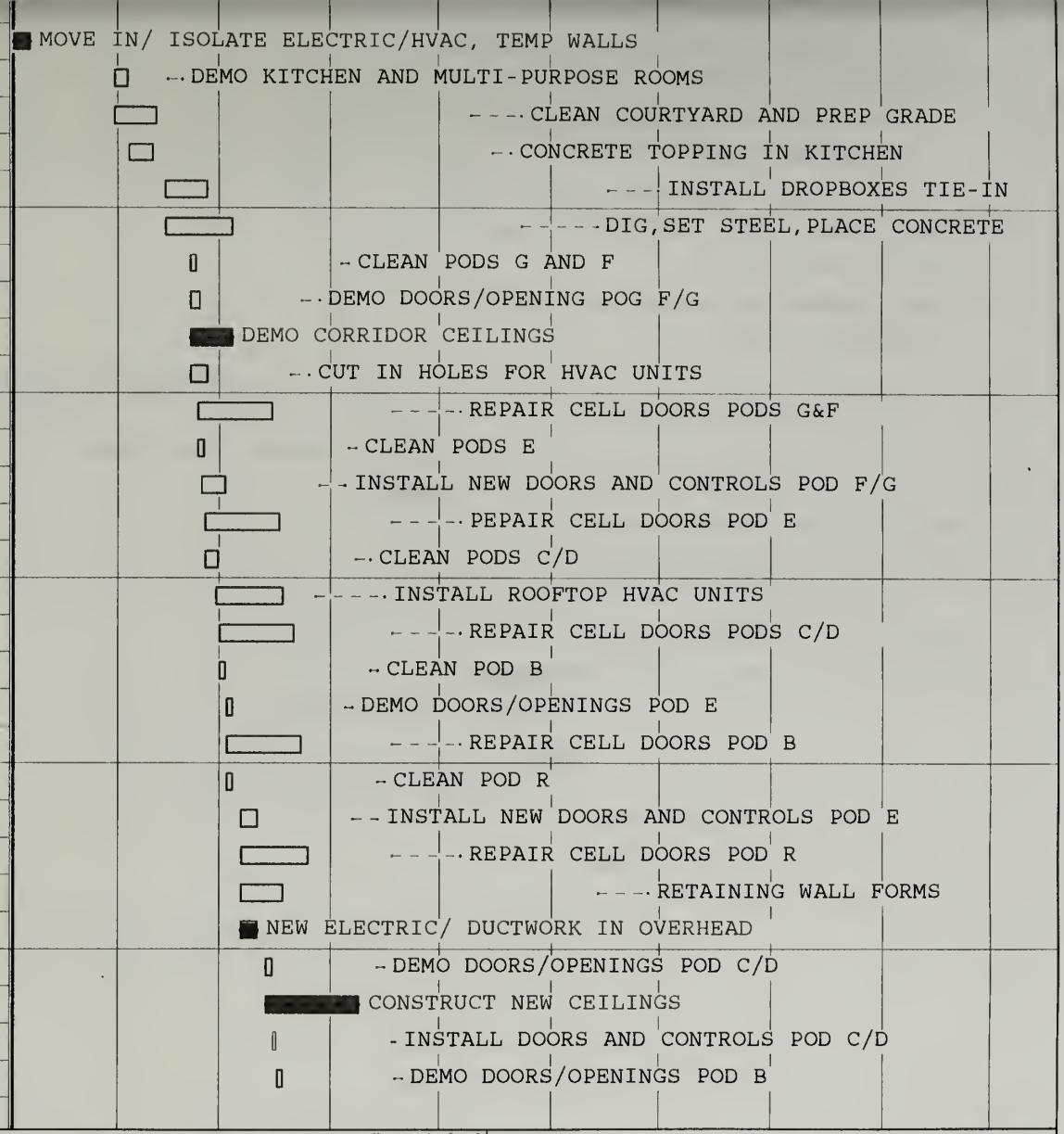

Plot Date 27JUN94
Data Date 3JAN94
Project Start 3JAN94
Project Finish 20SEP94

Activity Bar/Early Dates
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Date	Revision	Checked	Approved

1081	21MAR94	25MAR94	5	0
2080	21MAR94	23MAR94	3	0
3050	21MAR94	15APR94	20	0
2090	24MAR94	28MAR94	3	0
2000	28MAR94	29MAR94	2	0
3120	28MAR94	22APR94	20	0
3000	29MAR94	1APR94	4	0
2002	30MAR94	5APR94	5	0
3011	4APR94	8APR94	5	0
3010	6APR94	11APR94	4	0
3090	6APR94	3MAY94	20	0
3020	11APR94	9MAY94	21	0
3071	11APR94	6MAY94	20	0
3100	13APR94	10MAY94	20	0
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4030	2MAY94	13MAY94	10	0
3072	9MAY94	11MAY94	3	0
3130	9MAY94	3JUN94	20	0
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4010	14JUN94	20JUN94	5	0
4020	21JUN94	21JUN94	1	0
4021	22JUN94	23JUN94	2	0

QUAD K, PRISONER CELLS AND CORRIDOR

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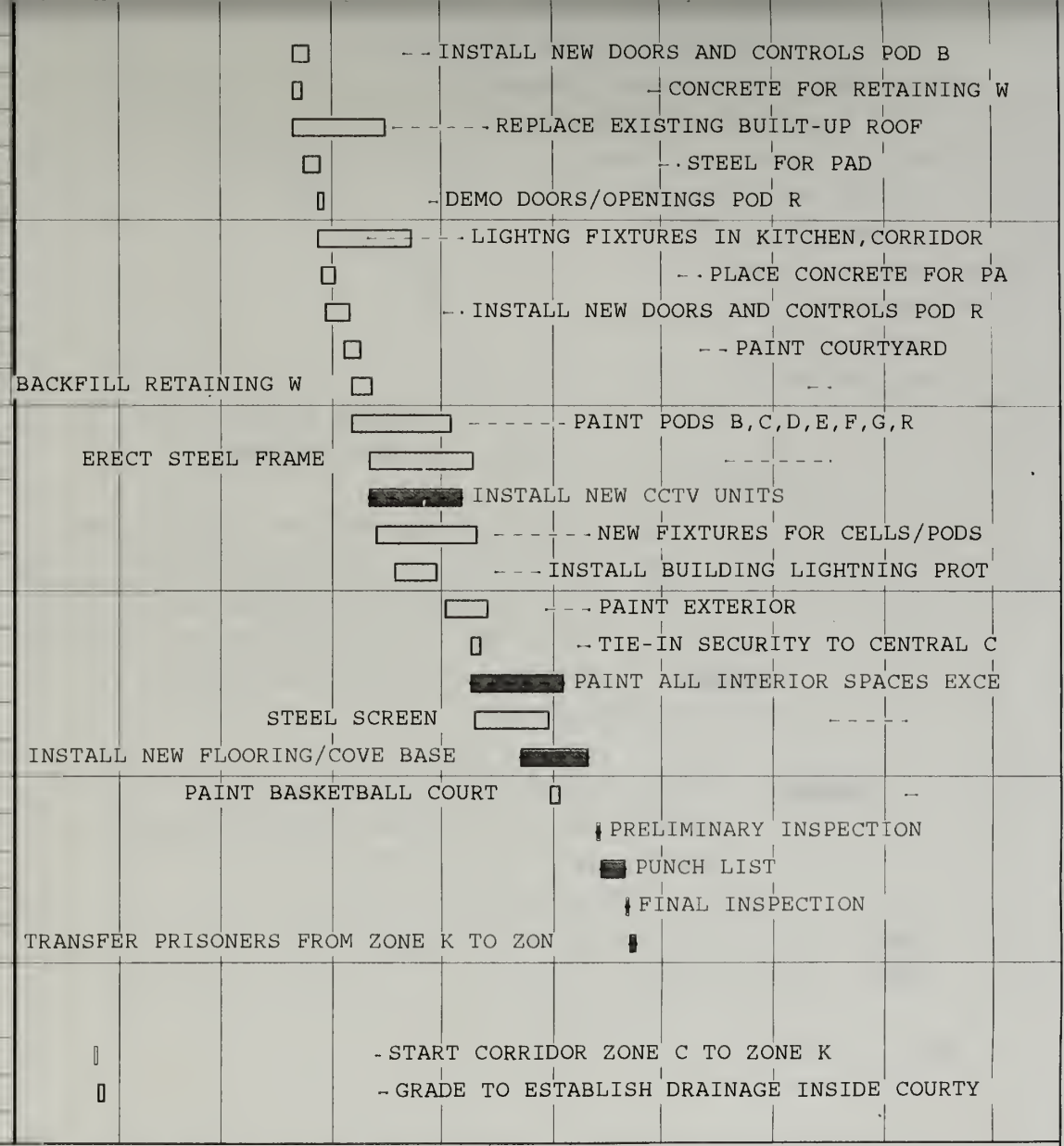

Plot Date 27JUN94
Data Date 3JAN94
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Project Finish 20SEP94

Activity Bar/Early Dates
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Date	Revision	Checked	Approved

9020	28JAN94	1FEB94	3	0
9030	2FEB94	22FEB94	15	0
9040	23FEB94	8MAR94	10	0
9050	9MAR94	22MAR94	10	0
9060	23MAR94	5APR94	10	0
9070	6APR94	19APR94	10	0
9090	20APR94	26APR94	5	0
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10010	6MAY94	12MAY94	5	0
10020	13MAY94	19MAY94	5	0
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7000	24JUN94	24JUN94	1	0
7010	27JUN94	1JUL94	5	0
7039	27JUN94	1JUL94	5	0
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7040	4JUL94	29JUL94	20	0
7030	25JUL94	5AUG94	10	0
7041	1AUG94	12AUG94	10	0
7060	1AUG94	26AUG94	20	0
7031	8AUG94	10AUG94	3	0
7070	8AUG94	12AUG94	5	0
7080	15AUG94	19AUG94	5	0
7065	29AUG94	9SEP94	10	0
7090	29AUG94	9SEP94	10	0
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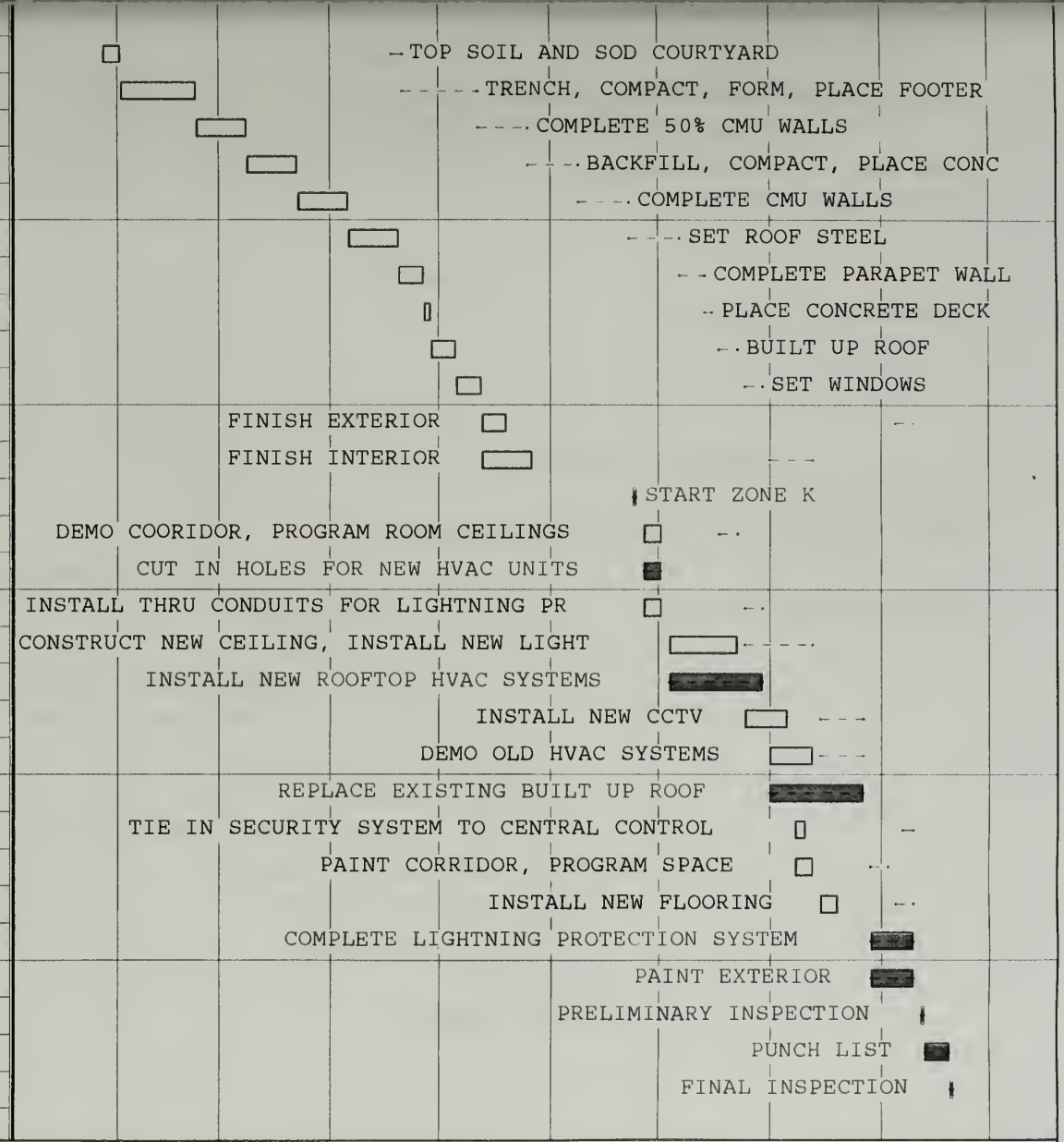
8020	20SEP94	20SEP94	1	0



Plot Date 27JUN94
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Activity Bar/Early Dates
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5000	17JAN94	17JAN94	1	0
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5020	18JAN94	31JAN94	10	0
5029	18JAN94	24JAN94	5	0
5034	18JAN94	24JAN94	5	0
5049	18JAN94	21JAN94	4	0
6000	18JAN94	24JAN94	5	0
5030	25JAN94	14FEB94	15	0
5040	1FEB94	21FEB94	15	0
5060	1FEB94	21FEB94	15	0
6010	1FEB94	21FEB94	15	0
5070	8FEB94	7MAR94	20	0
5050	15FEB94	14MAR94	20	0
3042	21FEB94	23FEB94	3	0
6011	22FEB94	24FEB94	3	0
5080	8MAR94	11APR94	25	0
5035	15MAR94	4APR94	15	0
5090	12APR94	25APR94	10	0
6020	12APR94	9MAY94	20	0
6060	6MAY94	19MAY94	10	0
6030	10MAY94	30MAY94	15	0
6061	10MAY94	12MAY94	3	0
6040	31MAY94	20JUN94	15	0
6050	21JUN94	27JUN94	5	0
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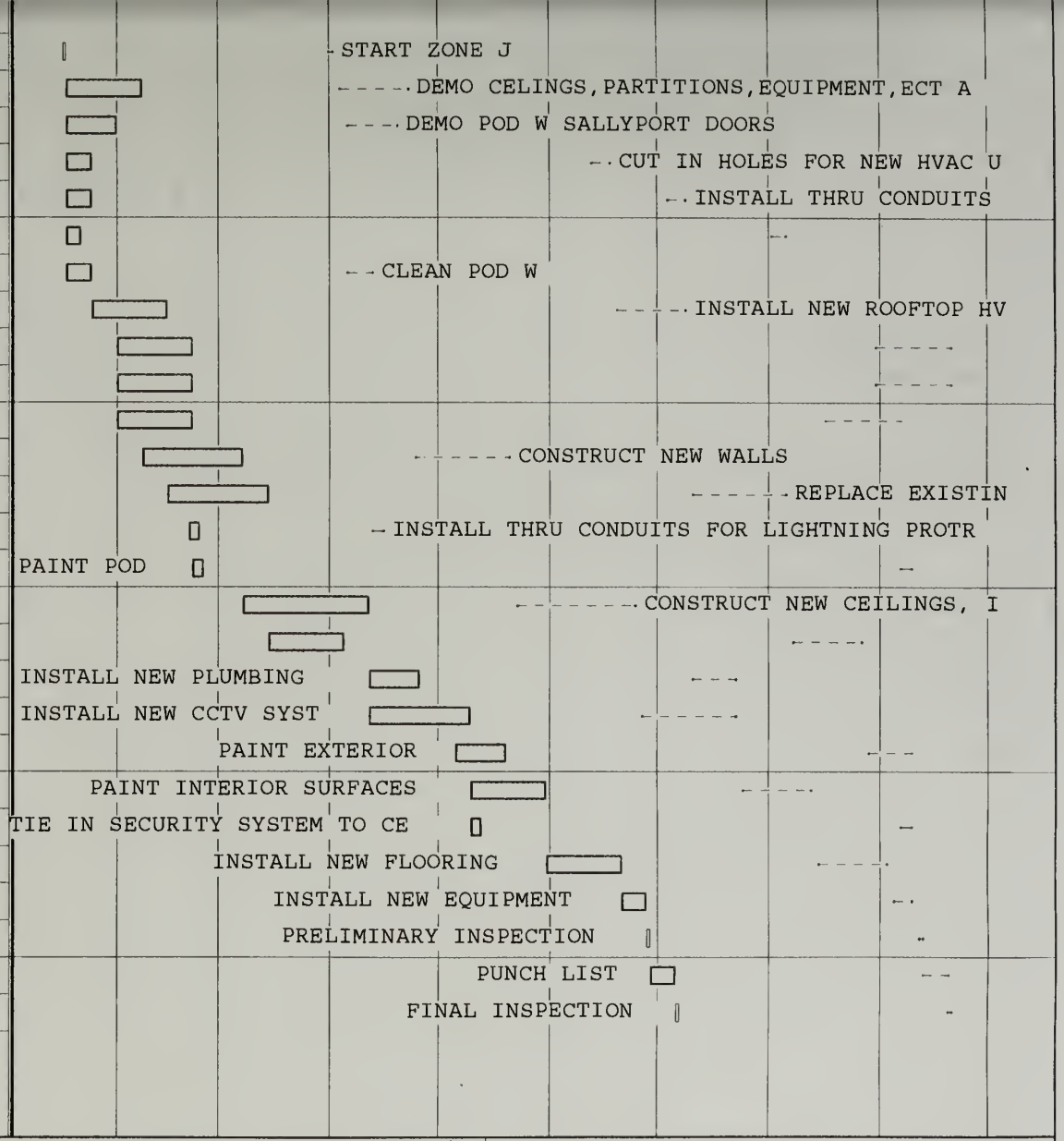
6080	29JUN94	5JUL94	5	0
6090	6JUL94	6JUL94	1	0



Plot Date 27JUN94
Data Date 3JAN94
Project Start 3JAN94
Project Finish 20SEP94

Activity Bar/Early Datee
Critical Activity
Progress Bar
Activity Late Datee
Milestone/Flag Activity

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PERRY-PARRISH JOINT VENTURE
RENOVATION EXISTING JAIL
RENOVATION OF QUADS H,J,K AND CORR

ALACHUA COUNTY CORRECTIONAL FACILITY

Date	Revision	Checked	Approved

11001	3JAN94	7JAN94	5	0
11010	10JAN94	14JAN94	5	0
11020	17JAN94	19JAN94	3	0
11030	20JAN94	26JAN94	5	0
11080	16FEB94	18FEB94	3	0
ACCESS ROAD				
11040	3JAN94	6JAN94	4	0
11050	7JAN94	13JAN94	5	0
11051	14JAN94	18JAN94	3	0
11060	19JAN94	1FEB94	10	0
11070	2FEB94	15FEB94	10	0
WOMEN'S DORM RETAINING WALL				
11090	3JAN94	3JAN94	1	0
12000	4JAN94	7JAN94	4	0
12010	10JAN94	13JAN94	4	0
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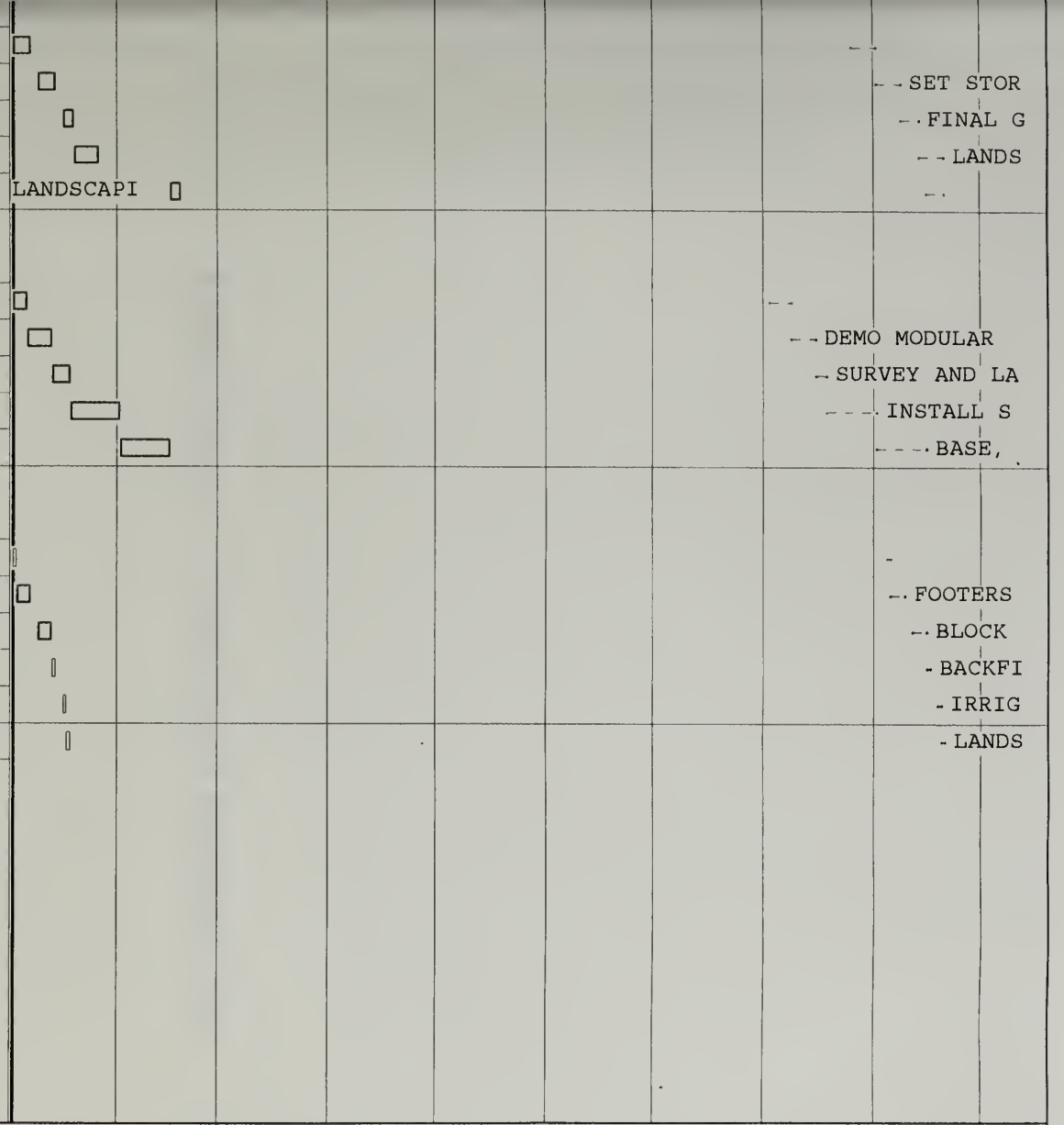

Plot Date 27JUN94
Data Date 3JAN94
Project Start 3JAN94
Project Finish 20SEP94

Activity Bar/Early Dates
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PERRY-PARRISH JOINT VENTURE
RENOVATION EXISTING JAIL
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Date	Revision	Checked	Approved

APPENDIX B: UPDATED SCHEDULE

1000	3JAN94A	24FEB94A	0	100	MOVE IN/ ISOLATE ELECTRIC/HVAC, TEMP WALLS
2020	28FEB94A	2MAR94A	0	100	DEMO CORRIDOR CEILINGS
2030	1MAR94A	25MAY94	1	90	CLEAN COURTYARD AND PRE
2050	1MAR94A	15MAR94A	0	100	DIG,SET STEEL,PLACE CONCRETE FOR FOOTERS
1010	2MAR94A	10MAR94A	0	100	CLEAN PODS G AND F
1050	2MAR94A	10MAR94A	0	100	CLEAN PODS C/D
1070	2MAR94A	8MAR94A	0	100	CLEAN POD B
1030	3MAR94A	8MAR94A	0	100	CLEAN PODS E
3039	5MAR94A	10MAR94A	0	100	CUT IN HOLES FOR HVAC UNITS
2010	16MAR94A	11APR94A	0	100	DEMO KITCHEN AND MULTI-PURPOSE ROOMS
2070	21MAR94A	7APR94A	0	100	RETAINING WALL FORMS
3050	22MAR94A	26MAY94	0	99	REPLACE EXISTING BUILT-UP ROOF
2080	28MAR94A	7APR94A	0	100	CONCRETE FOR RETAINING WALL
2040	1APR94A	4APR94A	0	100	INSTALL DROPBOXES TIE-IN
1011	4APR94A	2MAY94A	0	100	REPAIR CELL DOORS PODS G&F
1031	4APR94A	2MAY94A	0	100	PEPAIR CELL DOORS POD E
3010	4APR94A	18APR94A	0	100	BACKFILL RETAINING WALL
1060	10APR94A	15APR94A	0	100	DEMO DOORS/OPENINGS POD C/D
1020	11APR94A	29APR94A	0	100	DEMO DOORS/OPENING POG F/G
1051	11APR94A	9MAY94A	0	100	REPAIR CELL DOORS PODS C/D
1040	15APR94A	20APR94A	0	100	DEMO DOORS/OPENINGS POD E
1080	15APR94A	21APR94A	0	100	DEMO DOORS/OPENINGS POD B
3072	15APR94A	27JUL94	3	10	TIE-IN SECURITY TO CENTRAL C
1071	19APR94A	9MAY94A	0	100	REPAIR CELL DOORS POD B
3041	25APR94A	7JUN94	8	25	INSTALL BUILDING LIGHTNING PROT
3060	25APR94A	27MAY94	3	50	NEW ELECTRIC/ DUCTWORK IN OVERHEAD
3040	26APR94A	2MAY94A	0	100	INSTALL ROOFTOP HVAC UNITS
1021	1MAY94A	7JUN94	5	0	INSTALL NEW DOORS AND CONTROLS PO
1090	25MAY94	26MAY94	2	0	CLEAN POD R

Plot Date 27JUN94
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PERRY-PARRISH JOINT VENTURE
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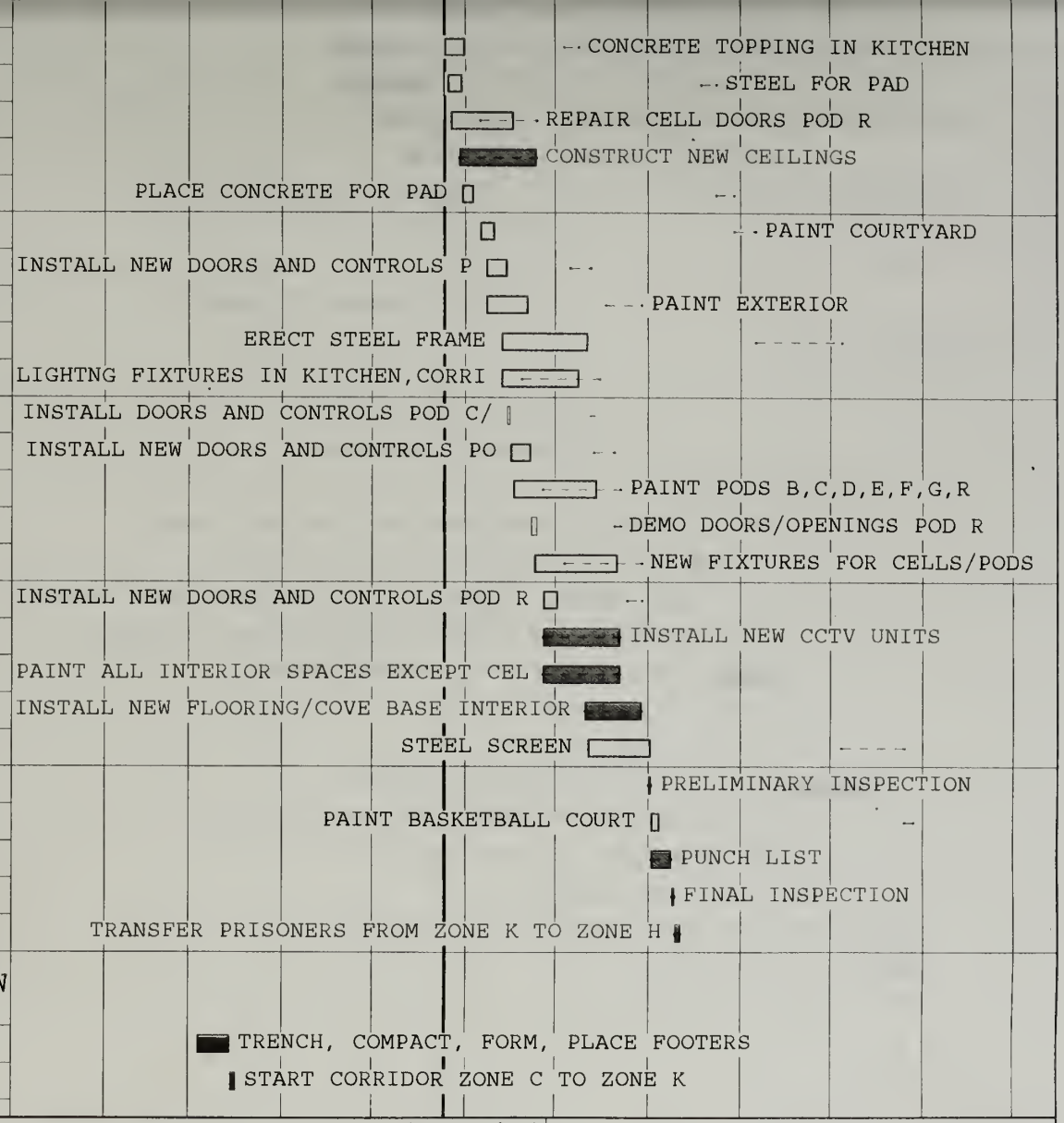
Date	Revision	Checked	Approved

3080	25MAY94	31MAY94	5	0
2090	26MAY94	30MAY94	3	0
1091	27MAY94	16JUN94	15	0
3070	30MAY94	24JUN94	20	0
3000	31MAY94	3JUN94	4	0
3011	6JUN94	10JUN94	5	0
1041	8JUN94	14JUN94	5	0
4030	8JUN94	21JUN94	10	0
3020	13JUN94	11JUL94	21	0
3120	13JUN94	8JUL94	20	0
1061	15JUN94	15JUN94	1	0
1081	16JUN94	22JUN94	5	0
3090	17JUN94	14JUL94	20	0
2000	23JUN94	24JUN94	2	0
3100	24JUN94	21JUL94	20	0
2002	27JUN94	1JUL94	5	0
3071	27JUN94	22JUL94	20	0
3130	27JUN94	22JUL94	20	0
3140	11JUL94	29JUL94	15	0
3030	12JUL94	1AUG94	15	0
4000	1AUG94	1AUG94	1	0
3035	2AUG94	4AUG94	3	0
4010	2AUG94	8AUG94	5	0
4020	9AUG94	9AUG94	1	0
4021	10AUG94	11AUG94	2	0
QUAD K, PRISONER CELLS AND CORRIDOR BETW				
9030	4MAR94A	14MAR94A	0	100
9000	15MAR94A	16MAR94A	0	100



Plot Date 27JUN94
Data Date 25MAY94
Project Start 3JAN94
Project Finish 8NOV94

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9010	18APR94A	11MAY94A	0	100
9040	21APR94A	17MAY94A	0	100
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9060	17MAY94A	2JUN94	2	80
10010	17MAY94A	19MAY94A	0	100
9070	3JUN94	16JUN94	10	0
9090	17JUN94	23JUN94	5	0
9080	24JUN94	27JUN94	2	0
10000	28JUN94	4JUL94	5	0
10020	5JUL94	11JUL94	5	0
10030	5JUL94	18JUL94	10	0
7000	12AUG94	12AUG94	1	0
7010	15AUG94	19AUG94	5	0
7039	15AUG94	19AUG94	5	0
7050	15AUG94	19AUG94	5	0
7020	22AUG94	9SEP94	15	0
7040	22AUG94	16SEP94	20	0
7030	12SEP94	23SEP94	10	0
7041	19SEP94	30SEP94	10	0
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7070	26SEP94	30SEP94	5	0
7080	3OCT94	7OCT94	5	0
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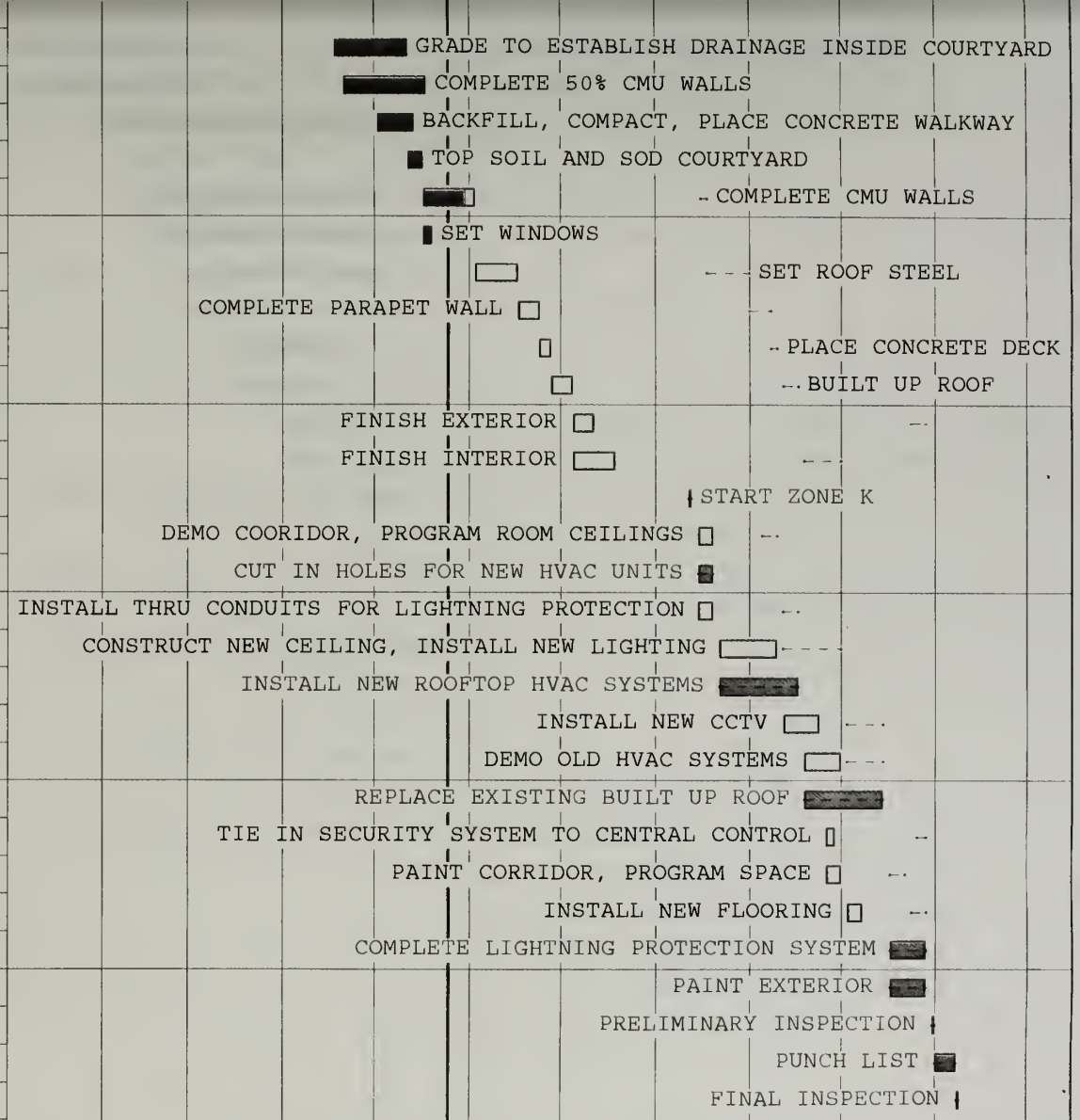

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Date	Revision	Checked	Approved

5010	3JAN94A	3MAR94A	0	100
5020	3JAN94A	3MAR94A	0	100
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5000	10FEB94A	11FEB94A	0	100
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5050	15FEB94A	13MAY94A	0	100
5040	23FEB94A	31MAY94	5	70
5029	3MAR94A	10MAR94A	0	100
5034	14MAR94A	27MAY94	3	50
5049	14MAR94A	26MAY94	2	50
3042	1APR94A	26MAY94	2	50
6020	1APR94A	22JUL94	18	10
5035	25APR94A	13JUN94	11	25
5030	26APR94A	30APR94A	0	100
5080	25MAY94	28JUN94	25	0
6000	25MAY94	31MAY94	5	0
6010	25MAY94	14JUN94	15	0
6011	15JUN94	17JUN94	3	0
6060	28JUN94	11JUL94	10	0
5090	29JUN94	12JUL94	10	0
6030	25JUL94	12AUG94	15	0
6061	25JUL94	27JUL94	3	0
6040	15AUG94	2SEP94	15	0
6050	5SEP94	9SEP94	5	0
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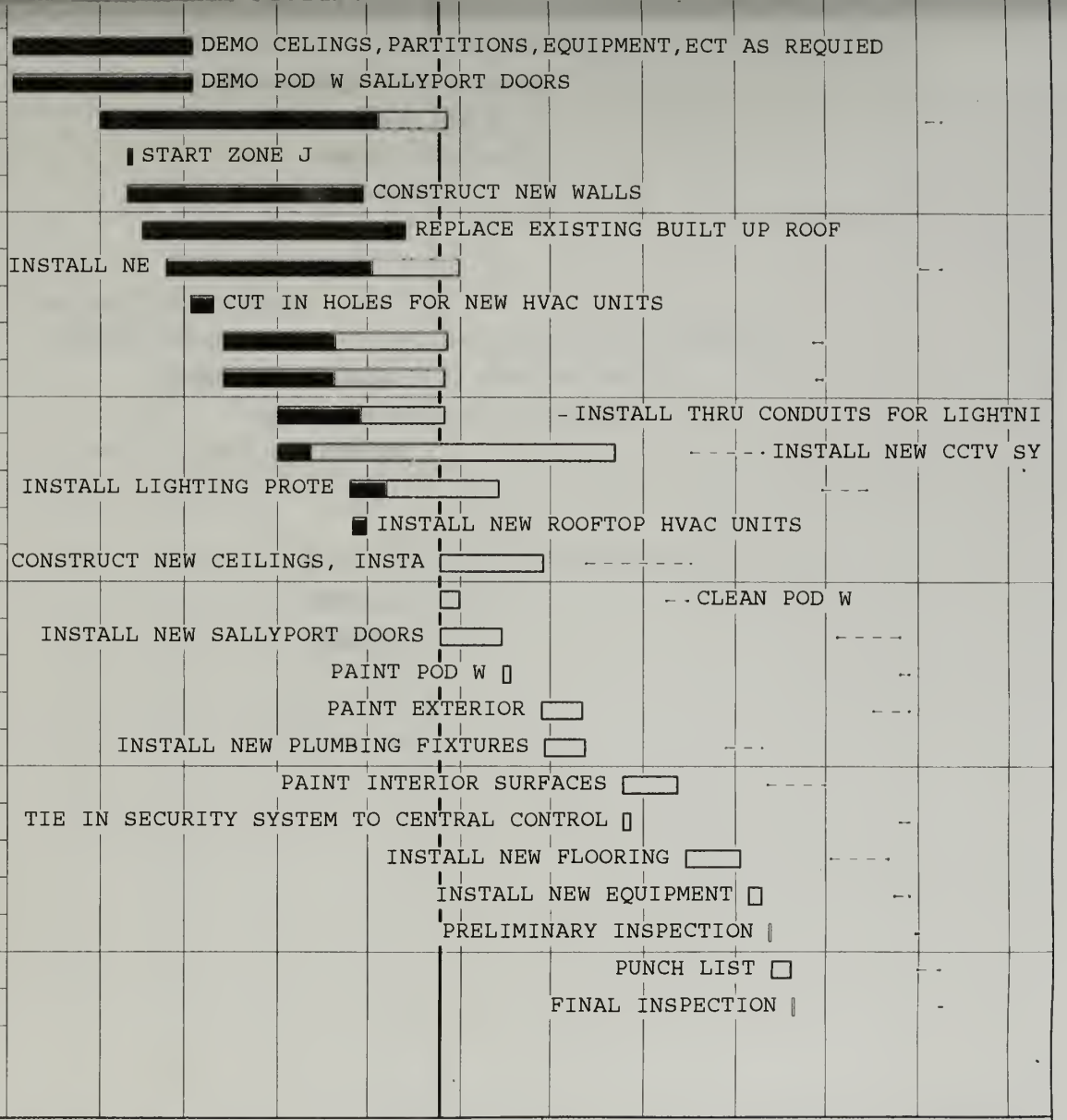

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RENOVATION EXISTING JAIL
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Date	Revision	Checked	Approved

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11010	28MAR94A	4APR94A	0	100
11030	18APR94A	6MAY94A	0	100
11080	26MAY94	30MAY94	3	0
ACCESS ROAD				
11051	17JAN94A	21JAN94A	0	100
11040	25JAN94A	4FEB94A	0	100
11050	23FEB94A	13MAY94A	0	100
11060	28MAR94A	4MAY94A	0	100
11070	1APR94A	25MAY94	1	90
WOMEN'S DORM RETAINING WALL				
11090	14APR94A	18APR94A	0	100
12000	14APR94A	3MAY94A	0	100
12010	14APR94A	6MAY94A	0	100
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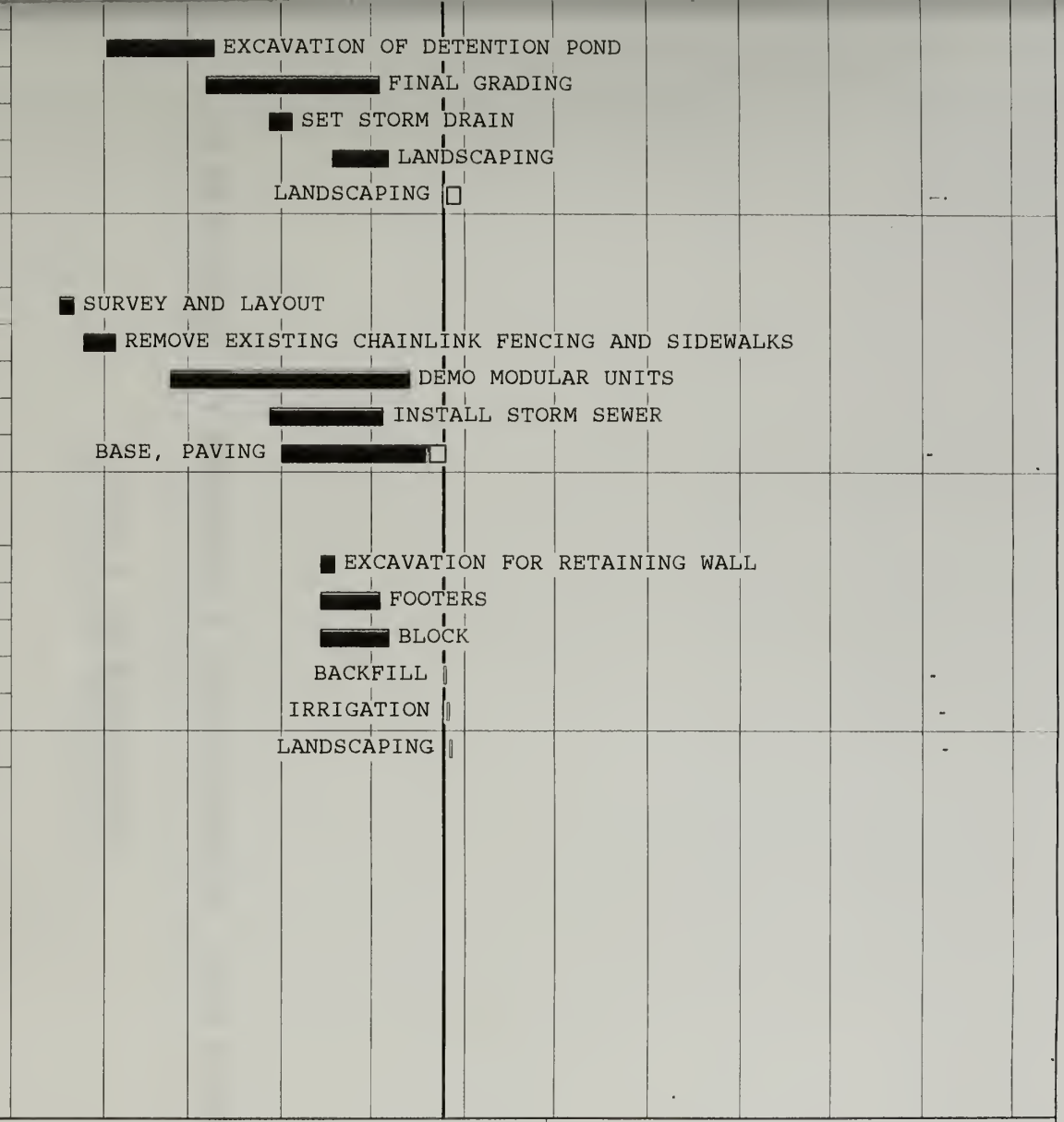

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PERRY-PARRISH JOINT VENTURE
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RENOVATION OF QUADS H,J,K AND CORR

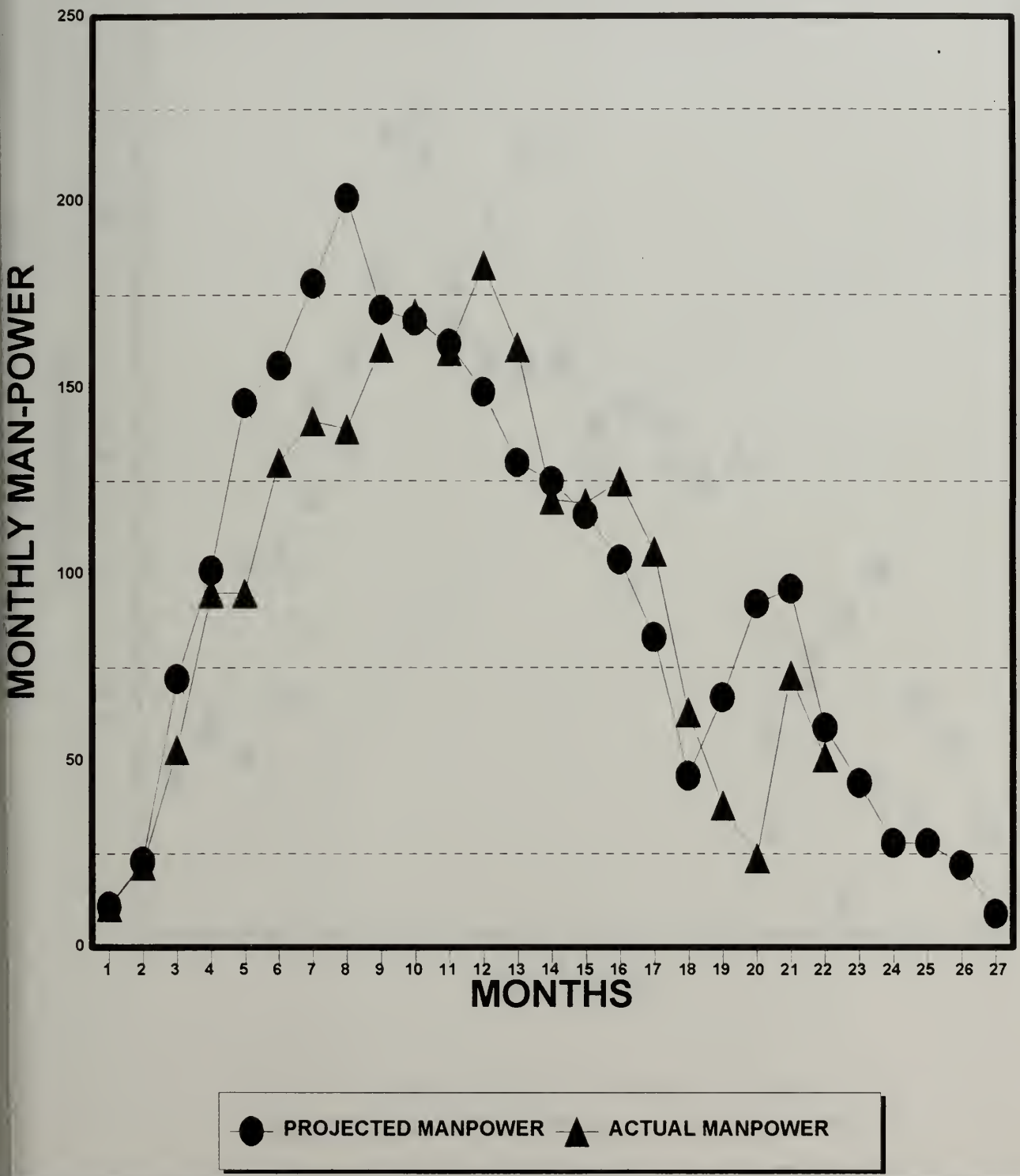
ALACHUA COUNTY CORRECTIONAL FACILITY

Date	Revision	Checked	Approved

APPENDIX C: PROJECT MANPOWER AND WORK IN PLACE REPORTS

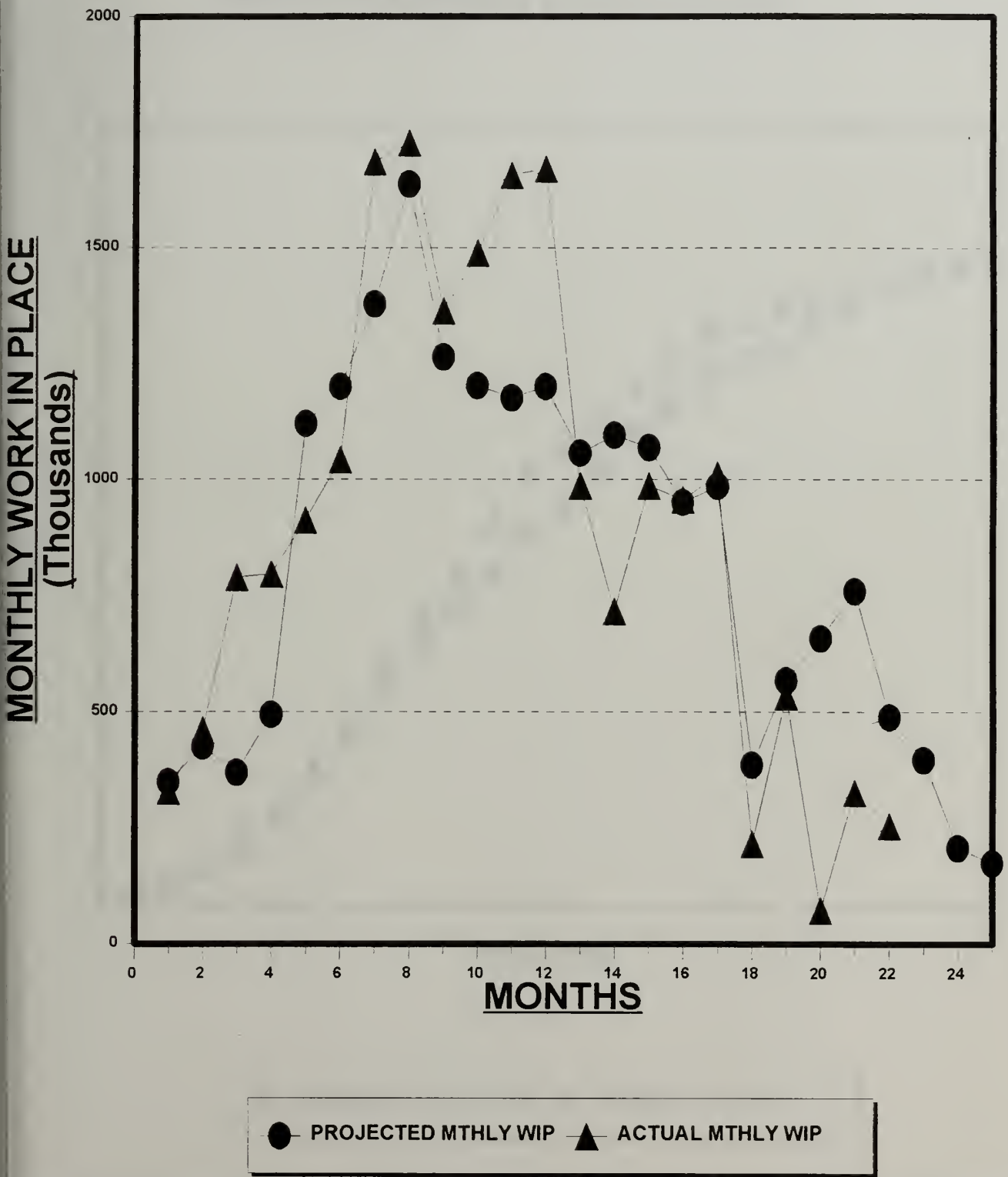
ALACHUA COUNTY DETENTION FACILITY

PERRY PARRISH a joint venture



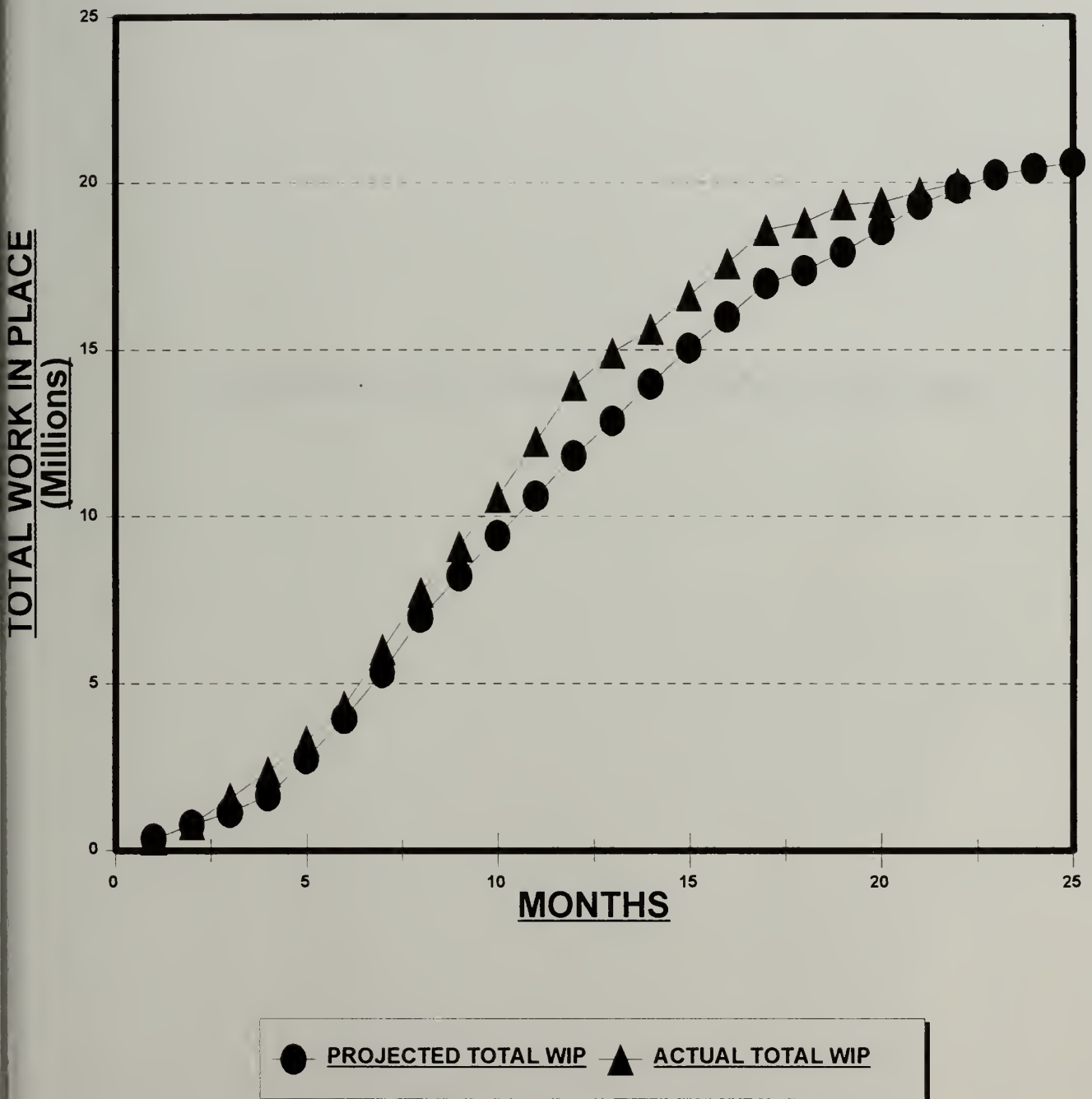
ALACHUA COUNTY DETENTION FACILITY

PERRY PARRISH a joint venture

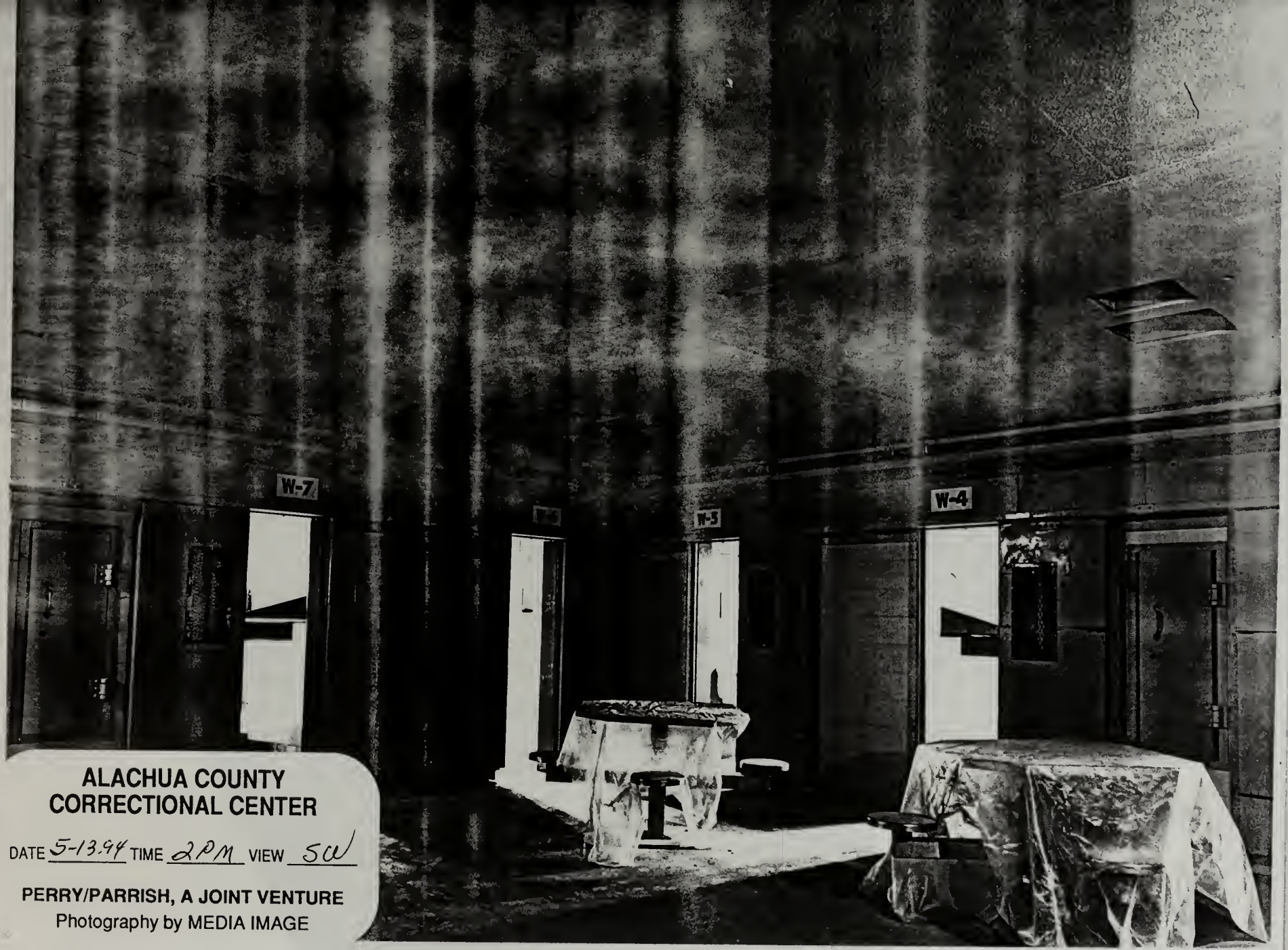


ALACHUA COUNTY DETENTION FACILITY

PERRY PARRISH a joint venture



APPENDIX D: PROJECT PHOTOGRAPHS



ALACHUA COUNTY CORRECTIONAL CENTER

DATE 5-13-94 TIME 2PM VIEW SW

PERRY/PARRISH, A JOINT VENTURE
Photography by MEDIA IMAGE

ALACHUA COUNTY
CORRECTIONAL CENTER

DATE 5-13-94 TIME 2PM VIEW SE

PERRY/PARRISH, A JOINT VENTURE
Photography by MEDIA IMAGE


ALACHUA COUNTY
CORRECTIONAL CENTER
DATE 5-13-94 TIME 2PM VIEW NE


ALACHUA COUNTY
CORRECTIONAL CENTER
DATE 5-13-94 TIME 2PM VIEW SW